

Notes - Are They Inverses

Remember: You can check graphically (see notes from 11/10)

Algebraically - Use Composition

IF $f[g(x)] = g[f(x)] = x$, then the functions are inverses.

Ex 1: Are $f(x) = 5x + 10$ and $g(x) = \frac{1}{5}x - 2$ inverses?

$$\begin{aligned} f[g(x)] &= 5\left(\frac{1}{5}x - 2\right) + 10 \\ &= x - 10 + 10 \\ &= x \end{aligned}$$

$$\begin{aligned} g[f(x)] &= \frac{1}{5}(5x + 10) - 2 \\ &= x + 2 - 2 \\ &= x \end{aligned}$$

YES

Ex 2: Are $f(x) = 3x + 4$ and $g(x) = 3x - 4$ inverses?

$$\begin{aligned} f[g(x)] &= 3(3x - 4) + 4 \\ &= 9x - 12 + 4 \end{aligned}$$

$$= 9x - 8$$

$$\neq x \Rightarrow \text{NO}$$